

1.1 **Minnesota Plumbing Board**

1.2 **Adopted Permanent Rules Adopting the 2018 Uniform Plumbing Code with**
1.3 **Amendments**

1.4 **4714.0050 TITLE; INCORPORATION BY REFERENCE.**

1.5 Chapters 2 to 11, 16, and 17 of the 2018 edition of the Uniform Plumbing Code (UPC)
1.6 as promulgated by the International Association of Plumbing and Mechanical Officials
1.7 (IAPMO), Ontario, California, and UPC appendices A, B, and I, are incorporated by reference
1.8 and made part of the Minnesota Plumbing Code except as qualified by the applicable
1.9 provisions in chapter 1300, and as amended in this chapter. The UPC is not subject to
1.10 frequent change and a copy of the UPC, with amendments for use in Minnesota, is available
1.11 in the office of the commissioner of labor and industry. Portions of this chapter reproduce
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1.14 **4714.0204 TERMS DEFINED BEGINNING WITH B.**

1.15 Subpart 1. **Added definition.** UPC section 204.0 is modified by adding the following
1.16 definition:

1.17 **Barometric Loop** - Means a section of pipe in the shape of an inverted "u" located upstream
1.18 and rising a minimum of 35 feet above the highest fixture it supplies.

1.19 Subp. 2. **Amended definition.** UPC section 204.0 is modified by amending the
1.20 following definition:

1.21 **Building Supply** - Means the pipe carrying potable water from the municipal water supply
1.22 or source of water supply to a building water meter, pressure tank, or other point of use or
1.23 distribution on the lot.

1.24 **4714.0207 TERMS DEFINED BEGINNING WITH E.**

1.25 UPC section 207.0 is modified by adding the following definition:

2.1 **Emergency Floor Drain** - Means floor drains that: do not serve as a receptor, are located
2.2 in restrooms, are under emergency eyewash/shower equipment, or are in laundry rooms.

2.3 **4714.0214 TERMS DEFINED BEGINNING WITH L.**

2.4 UPC section 214.0 is modified by adding the following definition:

2.5 **Low Pressure Water Dispenser** - Means a terminal fitting located downstream of a
2.6 pressure-reducing valve that dispenses hot drinking water above 160 degrees Fahrenheit
2.7 (71 degrees Celsius) or cold water or both at a pressure of 15 psi (105 kPa) or less.

2.8 **4714.0220 TERMS DEFINED BEGINNING WITH R.**

2.9 UPC section 220.0 is modified by amending the following definition:

2.10 **Registered Design Professional** - For purposes of this code, "registered design professional,"
2.11 "engineer," or "registered professional engineer" means a person practicing professional
2.12 engineering as described in Minnesota Statutes, section 326.02, subdivision 3, and who is
2.13 licensed in the state of Minnesota as a professional engineer by the Board of Architecture,
2.14 Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design
2.15 under Minnesota Statutes, section 326.10.

2.16 **4714.0225 TERMS DEFINED BEGINNING WITH W.**

2.17 UPC section 225.0 is modified by adding the following definition:

2.18 **Water Conditioning Equipment or Water Treating Equipment** - Means any appliance,
2.19 appurtenance, or fixture, or any combination thereof, designed to treat potable water, so as
2.20 to alter, modify, add, or remove any minerals, chemicals, or bacteria contained in the water.
2.21 Water conditioning equipment and water treating equipment includes but is not limited to
2.22 ion exchange water softeners, backwashing water filters, oxidizing water filters, cartridge
2.23 filters, chemical feed cartridges, ultraviolet lights, and equipment for reverse osmosis,
2.24 ultrafiltration, nanofiltration, pH adjustment, nitrate and arsenic removal, and adsorption
2.25 onto activated carbon.

3.1 **4714.0301 SECTION 301.0 GENERAL.**

3.2 Subpart 1. **Section 301.2.5 Existing Buildings.** UPC subsection 301.2.5 is deleted in
3.3 its entirety.

3.4 Subp. 2. **Section 301.3.** UPC section 301.3 is amended to read as follows:

3.5 **301.3 Alternate Materials and Methods of Construction Equivalency.** Nothing in this
3.6 code is intended to prevent the use of systems, methods, or devices of equivalent or superior
3.7 quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed
3.8 by this code. Prior to installation, technical documentation shall be submitted to the Authority
3.9 Having Jurisdiction to demonstrate equivalency. Unless prohibited by this code or by law,
3.10 the Authority Having Jurisdiction shall have the authority to approve or disapprove the
3.11 system, method, or device for the intended purpose.

3.12 However, the exercise of this discretionary approval by the Authority Having Jurisdiction
3.13 shall have no effect beyond the jurisdictional boundaries of the Authority Having Jurisdiction.
3.14 An alternate material or method of construction so approved shall not be considered as in
3.15 accordance with the requirements, intent, or both of this Code for a purpose other than that
3.16 granted by the Authority Having Jurisdiction where the submitted data does not prove
3.17 equivalency.

3.18 UPC subsections 301.3.1, 301.3.1.1, and 301.3.1.2 are preserved without amendment.

3.19 Subp. 3. **Section 301.5.6.** UPC section 301.5.6 is amended to read as follows:

3.20 **301.5.6 Inspection and Testing.** The alternative engineered design shall be tested and
3.21 inspected in accordance with the submitted testing and inspection plan and the
3.22 requirements of this code. Prior to the final plumbing inspection, the registered
3.23 professional engineer shall provide written certification to the administrative authority
3.24 that the system has been visually inspected by the registered professional engineer or

4.1 the registered professional engineer's designee, and the installation has been properly
 4.2 implemented according to the certified plans, calculations, and specifications.

4.3 **4714.0313 HANGERS AND SUPPORTS.**

4.4 Subpart 1. **Section 313.** Table 313.3 is amended to read as follows:

4.5 **TABLE 313.3**

4.6 **HANGERS AND SUPPORTS**

MATERIALS	TYPES OF JOINTS	HORIZONTAL	VERTICAL
Cast	Lead and Oakum	5 feet, except 10 feet where 10 foot lengths are installed ^{1,2,3}	Base and each floor, not to exceed 15 feet
	Compression Gasket	Every other joint, unless over 4 feet then support each joint ^{1,2,3}	Base and each floor, not to exceed 15 feet
Cast-Iron Hubless	Shielded Coupling	Every other joint, unless over 4 feet then support each joint ^{1,2,3,4}	Base and each floor, not to exceed 15 feet
Copper & Copper Alloys	Soldered, Brazed, Threaded, or Mechanical	1-1/2 inches and smaller, 6 feet; 2 inches and larger, 10 feet	Each floor, not to exceed 10 feet ⁵
Steel Pipe for Water or DWV	Threaded or Welded	3/4 inch and smaller, 10 feet; 1 inch and larger, 12 feet	Every other floor, not to exceed 25 feet ⁵
Steel Pipe for Gas	Threaded or Welded	1/2 inch, 6 feet; 3/4 inch and 1 inch, 8 feet; 1-1/4 inches and larger, 10 feet	1/2 inch, 6 feet; 3/4 inch and 1 inch, 8 feet; 1-1/4 inches every floor level
Schedule 40 PVC and ABS DWV	Solvent Cemented	All sizes, 4 feet; allow for expansion every 30 feet ^{3,6}	Base and each floor; provide mid-story guides; provide for expansion every 30 feet ⁶
CPVC	Solvent Cemented	1 inch and smaller, 3 feet; 1-1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides
CPVC-AL-CPVC	Solvent Cemented	1/2 inch, 5 feet; 3/4 inch, 65 inches; 1 inch, 6 feet	Base and each floor; provide mid-story guides

5.1 5.2	Lead	Wiped or Burned	Continuous Support	Not to exceed 4 feet
5.3 5.4	Steel	Mechanical	In accordance with standards acceptable to the Authority Having Jurisdiction	
5.5 5.6 5.7 5.8	PEX	Cold Expansion, Insert, and Compression	1 inch and smaller, 32 inches; 1-1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides
5.9 5.10 5.11	PEX-AL-PEX	Metal Insert and Metal Compression	1/2 inch; 3/4 inch; 1 inch All sizes 98 inches	Base and each floor; provide mid-story guides
5.12 5.13 5.14	PE-AL-PE	Metal Insert and Metal Compression	1/2 inch; 3/4 inch; 1 inch All sizes 98 inches	Base and each floor; provide mid-story guides
5.15 5.16	PE-RT	Insert and Compression	1 inch and smaller, 32 inches; 1-1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides
5.17 5.18 5.19 5.20 5.21 5.22 5.23 5.24	Polypropylene (PP)	Fusion Weld (socket, butt, saddle, electrofusion), Threaded (metal threads only), or Mechanical	1 inch and smaller, 32 inches; 1-1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides

5.25 For SI units: 1 inch = 25.4 mm, 1 foot = 304.8 mm

5.26 Notes:

5.27 ¹ Support adjacent to joint, not to exceed 18 inches (457 mm).

5.28 ² Brace not to exceed 40-foot (12,192 mm) intervals to prevent horizontal movement.

5.29 ³ Support at each horizontal branch connection.

5.30 ⁴ Hangers shall not be placed on the coupling.

6.1 ⁵ Vertical water lines shall be permitted to be supported in accordance with recognized
 6.2 engineering principles with regard to expansions and contraction, where first approved by
 6.3 the Authority Having Jurisdiction.

6.4 ⁶ For expansion joints, see Table 313.3.1.

6.5 Subp. 2. **Section 313.** Table 313.3.1 is added to read as follows:

6.6 **TABLE 313.3.1**

6.7 **Schedule 40 PVC and ABS DWV and Storm Pipe Expansion Table**

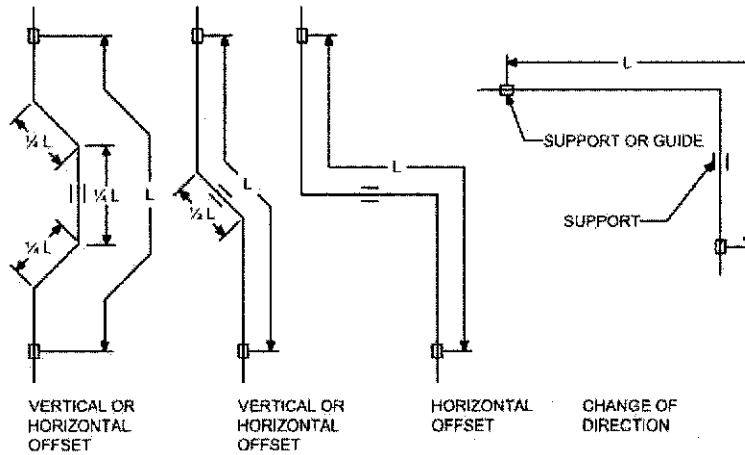
6.8 Inside the building thermal envelope

Pipe Size	Length of Run (ft.)		
	10 ¹	20 ¹	30
	Expansion joint length (in.) = L		
1.5"	20	28	34
2"	22	31	38
3"	27	38	46
4"	30	43	52
6"	37	52	63
8"	42	59	72
10"	47	66	80
12"	51	72	88

6.20 Outside the building thermal envelope

Pipe Size	Length of Run (ft.)		
	10 ¹	20 ¹	30
	Expansion joint length (in.) = L		
1.5"	26	36	44
2"	29	41	50
3"	35	49	60
4"	40	56	68

7.1	6"	48	68	83
7.2	8"	55	77	94
7.3	10"	61	86	105
7.4	12"	66	94	114



7.5 ¹ Multiple offsets shall be allowed to provide expansion for each 30-foot developed length
 7.6 of run.

7.7 Subp. 3. **Section 313.7.** UPC section 313.7 is deleted in its entirety.

7.8 **4714.0403 [Renumbered 4714.0412]**

7.9 **4714.0412 URINALS.**

7.10 UPC subsection 412.1.1 is amended to read as follows:

7.11 **412.1.1 Nonwater Urinals.** Nonwater urinals shall have a barrier liquid sealant to
 7.12 maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through
 7.13 the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and
 7.14 maintained in accordance with the manufacturer's instructions after installation. Where
 7.15 a nonwater urinal is installed, a water-supplied fixture shall be installed upstream of
 7.16 the nonwater urinal at the end of that same drainage branch.

8.1 **4714.0405 PROHIBITED FIXTURES.**

8.2 UPC section 405.3 is deleted in its entirety.

8.3 **4714.0406 [Renumbered 4714.0405]**

8.4 **4714.0407 LAVATORIES.**

8.5 Subpart 1. **UPC section 407.3.** UPC section 407.3 is amended as follows:

8.6 **407.3 Limitation of Hot Water Temperature for Public Lavatories.** Hot water delivered
8.7 from public-use lavatories shall be limited to a maximum temperature of 110 degrees
8.8 Fahrenheit (43 degrees Celsius). The maximum temperature shall be regulated by one of
8.9 the following means:

8.10 (1) a limiting device conforming to ASSE 1070/ASME A112.1070 /CSA B125.70; or

8.11 (2) a water heater conforming to ASSE 1084.

8.12 Subp. 2. UPC section 407.4 is deleted in its entirety.

8.13 **4714.0408 SHOWERS.**

8.14 UPC section 408.7 is amended to read as follows:

8.15 **408.7 Lining for Showers and Receptors.** Shower receptors built onsite shall be watertight
8.16 and shall be constructed from approved-type dense, nonabsorbent, and noncorrosive
8.17 materials. Each such receptor shall be adequately reinforced; shall be provided with an
8.18 approved flanged floor drain designed to make a watertight joint on the floor; and shall have
8.19 smooth, impervious, and durable surfaces. Unless the shower receptor is poured on the
8.20 ground as part of a slab, an approved shower liner must be provided in accordance with the
8.21 requirements of this section.

8.22 Shower receptors shall have the subfloor and rough side of walls to a height of not less
8.23 than 3 inches (76 mm) above the top of the finished dam or threshold shall be first lined
8.24 with sheet plastic, lead, or copper, or shall be lined with other durable and watertight

9.1 materials. Showers that are provided with a built-in place, permanent seat or seating area
9.2 that is located within the shower enclosure, shall be first lined with sheet plastic, lead,
9.3 copper, or shall be lined with other durable and watertight materials that extend not less
9.4 than 3 inches (76 mm) above horizontal surfaces of the seat or the seating area.

9.5 Lining materials shall be pitched 1/4 inch per foot (20.8 mm/m) to weep holes in the
9.6 subdrain of a smooth and solidly formed subbase. Such lining materials shall extend upward
9.7 on the rough jambs of the shower opening to a point not less than 3 inches (76 mm) above
9.8 the horizontal surfaces of the seat or the seating area, the top of the finished dam or threshold
9.9 and shall extend outward over the top of the permanent seat, permanent seating area, or
9.10 rough threshold and be turned over and fastened on the outside face of both the permanent
9.11 seat, permanent seating area, or rough threshold and the jambs.

9.12 Nonmetallic shower subpans or linings shall be permitted to be built up on the job site
9.13 of not less than three layers of standard-grade 15-pound (6.8 kg) asphalt-impregnated roofing
9.14 felt. The bottom layer shall be fitted to the formed subbase and each succeeding layer
9.15 thoroughly hot-mopped to that below. Corners shall be carefully fitted and shall be made
9.16 strong and watertight by folding or lapping, and each corner shall be reinforced with suitable
9.17 webbing hot-mopped in place.

9.18 Folds, laps, and reinforcing webbing shall extend not less than 4 inches (102 mm) in
9.19 all directions from the corner, and webbing shall be of approved type and mesh, producing
9.20 a tensile strength of not less than 50 pounds per square foot (lb/ft²) (244 kg/m²) in either
9.21 direction. Nonmetallic shower subpans or linings shall be permitted to consist of multilayers
9.22 of other approved equivalent materials suitably reinforced and carefully fitted in place on
9.23 the job site as elsewhere required in this section.

9.24 Linings shall be properly recessed and fastened to the approved backing so as not to
9.25 occupy the space required for the wall covering, and shall not be nailed or perforated at a
9.26 point that is less than 1 inch (25.4 mm) above the finished dam or threshold. An approved

10.1 type subdrain shall be installed with a shower subpan or lining. Each such subdrain shall
10.2 be of the type that sets flush with the subbase and shall be equipped with a clamping ring
10.3 or other device to make a tight connection between the lining and the drain. The subdrain
10.4 shall have weep holes into the waste line. The weep holes located in the subdrain clamping
10.5 ring shall be protected from clogging.

10.6 UPC subsections 408.7.1 through 408.7.5 are maintained without amendment.

10.7 **4714.0409 BATHTUBS AND WHIRLPOOL BATHTUBS.**

10.8 Subpart 1. UPC section 409.1 is amended to read as follows:

10.9 **409.1 Application.** Bathtubs shall comply with ASME A112.19.1/CSA B45.2, ASME
10.10 A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, CSA B45.5/IAPMO Z124, or CSA
10.11 B45.12 /IAPMO Z402. Whirlpool bathtubs shall comply with ASME A112.19.7/CSA
10.12 B45.10. Pressure sealed doors within bathtubs or whirlpool bathtub enclosures shall comply
10.13 with ASME A112.19.15. Whirlpool pedicure tubs shall comply with general requirements
10.14 and water retention sections of ASME A112.19.7 /CSA B45.10, Hydromassage Bathtub
10.15 Systems.

10.16 Subp. 2. UPC section 409.4 is amended to read as follows:

10.17 **409.4 Limitation of Hot Water Temperature in Bathtubs and Whirlpool Bathtubs.**

10.18 The maximum hot water temperature discharging from the bathtub and whirlpool bathtub
10.19 filler shall be limited to 120 degrees Fahrenheit (49 degrees Celsius). The maximum
10.20 temperature shall be regulated by one of the following means:

10.21 (1) a limiting device conforming to either ASSE 1070/ASME A112.1070 /CSA B125.70
10.22 or CSA B125.3; or

10.23 (2) a water heater conforming to ASSE 1084.

11.1 **4714.0410 BIDETS.**

11.2 UPC section 410.3 is amended to read as follows:

11.3 **410.3 Limitations of Water Temperature in Bidets.** The maximum hot water temperature
11.4 discharging from a bidet shall be limited to 110 degrees Fahrenheit (43 degrees Celsius).

11.5 The maximum temperature shall be regulated by one of the following means:

11.6 (1) a limiting device conforming to either ASSE 1070/ASME A112.1070 /CSA B125.70
11.7 or CSA B125.3; or

11.8 (2) a water heater conforming to ASSE 1084.

11.9 **4714.0414 DISHWASHING MACHINES.**

11.10 UPC section 414.3 is amended to read as follows:

11.11 **414.3 Drainage Connection.** Domestic dishwashing machines shall discharge indirectly
11.12 in accordance with section 807.3 into a waste receptor, a wye branch fitting on the tailpiece
11.13 of a kitchen sink, or dishwasher connection of a food waste disposer. Commercial
11.14 dishwashing machines shall discharge indirectly through an air break or direct connection.
11.15 The indirect discharge for commercial dishwashing machines shall be in accordance with
11.16 section 807.1, and the direct discharge shall be in accordance with section 704.3.

11.17 **4714.0416 EMERGENCY EYEWASH AND SHOWER EQUIPMENT.**

11.18 UPC section 416.2 is amended to read as follows:

11.19 **416.2 Water Supply.** Emergency eyewash and shower equipment shall not be limited in
11.20 the water supply flow rates. Where hot and cold water is supplied to an emergency shower
11.21 or eyewash station, the temperature of the water supply shall be controlled by a temperature
11.22 actuated mixing valve complying with ASSE 1071. Where water is supplied directly to an
11.23 emergency shower or eyewash station from a water heater, the water heater shall comply

12.1 with ASSE 1085. Flow rate, discharge pattern, and temperature of flushing fluids shall be
12.2 provided in accordance with ISEA Z358.1 based on the hazardous material.

12.3 **4714.0417 FAUCETS AND FIXTURE FITTINGS.**

12.4 UPC section 417 is amended by adding subsection 417.6 to read as follows:

12.5 **417.6 Low-Pressure Water Dispenser.** Beverage faucets shall comply with ASME
12.6 A112.18.1/CSA B125.1. Low-pressure water dispensers that dispense electrically heated
12.7 water and have a reservoir vented to the atmosphere shall comply with ASSE 1023. Electric
12.8 devices that heat water shall comply with UL 499.

12.9 **4714.0418 FLOOR DRAINS.**

12.10 Subpart 1. **Section 418.4.** UPC section 418.4 is amended to read as follows:

12.11 **418.4 Food Storage Areas.** Where drains are provided in storerooms, walk-in freezers,
12.12 walk-in coolers, refrigerated equipment, or other locations where food is stored, the drains
12.13 shall have indirect waste piping. Separate waste pipes shall be run from each food storage
12.14 area, each with an indirect connection to the building sanitary drainage system. Traps shall
12.15 be provided in accordance with section 801.3.2 and shall be vented.

12.16 Indirect drains shall be permitted to be located in freezers or other spaces where freezing
12.17 temperatures are maintained, provided that traps, where supplied, shall be located where
12.18 the seal will not freeze. Otherwise, the floor of the freezer shall be sloped to a floor drain
12.19 located outside of the storage compartment.

12.20 Subp. 2. **Section 418.** UPC section 418 is amended by adding the following
12.21 subsections.

12.22 **418.6 Elevator Pit Drain.** An elevator pit drain shall discharge to the sanitary sewer using
12.23 an indirect connection that precludes the possibility of sewage backup into the pit. If a sump
12.24 is used, it shall be outside the pit with a dry pan drain flowing to it.

13.1 **418.7 Garage and Parking Area Floor Drains.** Floor area drains in open parking areas,
13.2 including open areas of parking ramps, shall discharge to the storm sewer or to a place of
13.3 disposal satisfactory to the sewer authority. Floor drains in parking areas that are enclosed,
13.4 and floor drains in areas open or enclosed that are used for maintenance or as vehicle wash
13.5 bays, shall discharge to the sanitary sewer if a municipal sewer is available. An oil and
13.6 flammable liquid interceptor shall comply with section 1017 and shall be provided if required
13.7 by sections 1009.1, 1011.1, and 1017.1.

13.8 **Exception:** Floor drains in private garages serving one- and two-family dwellings may
13.9 discharge to daylight if approved by the administrative authority.

13.10 **4714.0420 SINKS.**

13.11 UPC section 420.4 is amended to read as follows:

13.12 **420.4 Waste Outlet.** Kitchen and laundry sinks shall have a waste outlet and fixture tailpiece
13.13 not less than 1-1/2 inches (40 mm) in diameter, except commercial pot and scullery sinks
13.14 shall be provided with waste outlets not less than 2 inches (50 mm) in diameter. Service
13.15 sinks shall have a waste outlet and fixture tailpiece not less than 2 inches (50 mm) in
13.16 diameter. Fixture tailpieces shall be constructed from the materials specified in Section
13.17 701.1 for drainage piping, provided, however, that the connections where exposed or
13.18 accessible shall be permitted to be of seamless drawn brass not less than No. 20 B & S
13.19 Gauge (0.032 inches) (0.81 mm). Waste outlets shall be provided with an approved strainer.

13.20 **4714.0423 TRENCH DRAINS.**

13.21 Section 423 is added as follows:

13.22 **423.0 Trench Drains.**

13.23 **423.1 Trench Drains.** Trench drains shall comply with ASME A112.6.3, ASME A112.3.1,
13.24 or be constructed of watertight material and watertight joints, and be tested for watertightness
13.25 by filling with water to the level of the flood rim of the trench drain.

14.1 **4714.0501 GENERAL.**

14.2 UPC section 501.1 is amended to read as follows:

14.3 **501.1 Applicability.** The regulations of this chapter shall govern the construction, location,
14.4 and installation of fuel-burning and other water heaters heating potable water. The minimum
14.5 capacity for storage water heaters shall be in accordance with the first hour rating listed in
14.6 Table 501.1(2). No water heater shall be hereinafter installed that does not comply with the
14.7 type and model of each size thereof approved by the Authority Having Jurisdiction. A list
14.8 of accepted water heater appliance standards is referenced in Table 501.1(1). Listed
14.9 appliances shall be installed in accordance with the manufacturer's installation instructions.
14.10 Unlisted water heaters shall be permitted in accordance with section 504.3.2.

14.11 **4714.0504 WATER HEATER REQUIREMENTS.**

14.12 Subpart 1. **Sections 504.1 to 504.2.** UPC sections 504.1 to 504.2 are deleted in their
14.13 entirety.

14.14 Subp. 2. **Section 504.6.** UPC section 504.6 is amended to read as follows:

14.15 **504.6 Temperature, Pressure, and Vacuum Relief Devices.** The installation of temperature,
14.16 pressure, and vacuum relief devices, or combinations thereof, shall be installed in accordance
14.17 with the terms of their listings and the manufacturer's installation instructions. A shutoff
14.18 valve shall not be placed between the relief valve and the water heater or on discharge pipes
14.19 between the valves and the atmosphere. The hourly British thermal units (Btu) (kW h)
14.20 discharge capacity or the rated steam relief capacity of the device shall be not less than the
14.21 input rating of the water heater. Discharge piping shall be installed in accordance with
14.22 section 608.5.

14.23 **4714.0507 OTHER WATER HEATER INSTALLATION REQUIREMENTS.**

14.24 Subpart 1. **Sections 507.6 to 507.11 and 507.14 to 507.23.** UPC sections 507.6 to
14.25 507.11 and 507.14 to 507.23 are deleted in their entirety.

15.1 Subp. 2. [See repealer.]

15.2 **4714.0508 APPLIANCES ON ROOFS.**

15.3 UPC sections 508.1 to 508.3.3 are deleted in their entirety.

15.4 **4714.0509 VENTING OF APPLIANCES.**

15.5 UPC sections 509.0 to 509.15, including all tables and figures, are deleted in their
15.6 entirety.

15.7 **4714.0601 HOT AND COLD WATER REQUIRED.**

15.8 UPC section 601.2 is amended to read as follows:

15.9 **601.2 General.** Each plumbing fixture shall be provided with an adequate supply of potable
15.10 running water piped to it in an approved manner, so arranged as to flush and keep the fixture
15.11 in a clean and sanitary condition without danger of backflow or cross-connection. Water
15.12 closets and urinals shall be flushed by means of an approved flush tank or flushometer valve.

15.13 **Exception:** Listed fixtures that do not require water for their operation and are not
15.14 connected to the water supply.

15.15 **601.2.1 Hot Water Required.** In occupancies where plumbing fixtures are installed
15.16 for private use, hot water shall be required for bathing, washing, laundry, cooking
15.17 purposes, dishwashing, and maintenance. In occupancies where plumbing fixtures are
15.18 installed for public use, hot water shall be required for bathing and washing purposes.
15.19 This requirement shall not supersede the requirements for individual temperature control
15.20 limitations for public lavatories, bidets, bathtubs, whirlpool bathtubs, and shower control
15.21 valves.

15.22 **601.2.2 Hot Water Recirculation.** Hot water supply systems in four-story buildings
15.23 or higher, or buildings where the developed length of hot water piping from the source

16.1 of hot water supply to the farthest fixture supplied exceeds 100 feet, shall be of the
16.2 return circulation type.

16.3 **4714.0603 CROSS-CONNECTION CONTROL.**

16.4 *[For text of subparts 1 to 3, see Minnesota Rules]*

16.5 Subp. 4. **Section 603.5.17.** UPC section 603.5.17 is amended to read as follows:

16.6 **603.5.17 Potable Water Outlets and Valves.** Potable water outlets, freeze-proof yard
16.7 hydrants, combination stop-and-waste valves, or other fixtures that incorporate a
16.8 stop-and-waste feature that drains into the ground shall not be installed underground
16.9 except for a freeze-proof yard hydrant that is located at least two feet above the water
16.10 table and at least ten feet from any sewer or similar source of contamination.

16.11 Subp. 5. **Section 603.5.** UPC section 603.5 is amended by adding the following
16.12 subsections:

16.13 **603.5.22 Barometric Loop.** A barometric loop is an acceptable method of protection
16.14 of water connections where an actual or potential backsiphonage hazard exists that is
16.15 not subject to backpressure.

16.16 **603.5.23 Installation of Testable Backflow Prevention Assembly.** Testable backflow
16.17 prevention assemblies meeting ASSE Standard 1013, 1015, 1020, 1047, 1048, or 1056
16.18 shall be installed, tested, maintained, and removed in accordance with sections
16.19 603.5.23.1 through 603.5.23.4.

16.20 **603.5.23.1 Notification of Installation.** The administrative authority shall be
16.21 notified before installation of a testable backflow prevention assembly. The public
16.22 water supplier shall be notified of the installed testable backflow preventer assembly
16.23 within 30 days following installation on a community public water system.

17.1 **603.5.23.2 Testing and Maintenance.** The installation of a testable backflow
17.2 prevention assembly is permitted only when a periodic testing and inspection
17.3 program conducted by qualified personnel is provided by an agency acceptable to
17.4 the administrative authority. Inspection intervals shall not exceed one year. The
17.5 administrative authority may require more frequent testing if deemed necessary
17.6 to ensure protection of the potable water. A testable backflow prevention assembly
17.7 shall be inspected after initial installation to ensure that it has been properly installed
17.8 and that debris resulting from the piping installation has not interfered with the
17.9 functioning of the assembly.

17.10 **603.5.23.3 Inspection and Records.** A test and inspection tag shall be affixed to
17.11 the testable backflow prevention assembly. The tester shall date and sign the tag
17.12 and include the tester's backflow prevention tester certification number. Written
17.13 records of testing and maintenance shall be maintained and submitted to the
17.14 administrative authority, and to the public water supplier, within 30 days of testing
17.15 if installed on a community public water system.

17.16 **603.5.23.4 Notification of Removal.** The Authority Having Jurisdiction, in addition
17.17 to the public water supplier, shall be notified within 30 days following removal
17.18 of a testable backflow prevention assembly from a community public water system.

17.19 **4714.0607 POTABLE WATER SUPPLY TANKS.**

17.20 Subpart 1. **Section 607.3.** UPC section 607.3 is amended to read as follows:

17.21 **607.3 Venting.** Tanks used for potable water shall be tightly covered and vented in
17.22 accordance with manufacturer's installation instructions. Such vent shall open downward
17.23 and be screened with a corrosion-resistant material of not less than number 24 mesh. The
17.24 vent opening shall not be located in an environment that can contaminate the water supply.

17.25 Subp. 2. **Section 607.4.** UPC section 607.4 is amended to read as follows:

18.1 **607.4 Overflow.** Tanks shall have an overflow that opens downward and is screened with
18.2 a corrosion-resistant material of not less than number 24 mesh. The overflow pipe shall be
18.3 of sufficient diameter to permit waste of water in excess of the maximum filling rate. The
18.4 overflow pipe shall discharge through an air gap.

18.5 **4714.0608 WATER PRESSURE, PRESSURE REGULATORS, PRESSURE RELIEF**
18.6 **VALVES, AND VACUUM RELIEF VALVES.**

18.7 UPC section 608.5 is amended to read as follows:

18.8 **608.5 Discharge Piping.** The discharge piping serving a temperature relief valve, pressure
18.9 relief valve, or combination of both shall have no valves, obstructions, or means of isolation
18.10 and shall:

18.11 (1) be equal to the size of the valve outlet and shall discharge full size to the flood level of
18.12 the area receiving the discharge and pointing down;

18.13 (2) consist of materials rated at not less than the operating temperature of the system and
18.14 shall be approved for such use or comply with ASME A112.4.1;

18.15 (3) discharge independently by gravity through an air gap to a safe place of disposal or
18.16 within 18 inches of the floor. Relief valve drains shall not terminate in a building's crawl
18.17 space;

18.18 (4) discharge in such a manner that does not cause personal injury or structural damage;

18.19 (5) not consist of any part that may be trapped or subject to freezing;

18.20 (6) not consist of a threaded terminal end of the pipe; and

18.21 (7) not discharge from a relief valve into a water heater pan.

18.22 **4714.0609 INSTALLATION, TESTING, UNIONS, AND LOCATION.**

18.23 Subpart 1. **Section 609.1.** UPC section 609.1 is amended to read as follows:

19.1 **609.1 Installation.** Water piping shall be adequately supported in accordance with Table
19.2 313.3. Burred ends shall be reamed to the full bore of the pipe or tube. Changes in directions
19.3 shall be made by the appropriate use of fittings, except that changes in direction in copper
19.4 or copper alloy tubing shall be permitted to be made with bends, provided that such bends
19.5 are made with bending equipment that does not deform or create a loss in the cross-sectional
19.6 area of the tubing. Changes in direction are allowed with flexible pipe and tubing without
19.7 fittings in accordance with the manufacturer's instructions. Provisions shall be made for
19.8 expansion in hot-water piping. Piping, equipment, appurtenances, and devices shall be
19.9 installed in a workmanlike manner in accordance with the provisions and intent of this code.
19.10 Building supply and yard piping shall be located not less than 12 inches (305 mm) below
19.11 the maximum local frost depth, in accordance with Section 312.6, or an alternative approved
19.12 by the Authority Having Jurisdiction. The cover shall be not less than 12 inches (305 mm)
19.13 below finish grade.

19.14 Subpart 1. [Renumbered subp 2]

19.15 Subp. 2. **Section 609.6.** UPC section 609.6 is amended to read as follows:

19.16 **609.6 Location.** Except as provided in section 609.7, no building supply shall be located
19.17 in a lot other than the lot that is the site of the building or structure served by the building
19.18 supply.

19.19 **609.6.1 Water Supply Near Sources of Contamination.** Potable water supply pipes
19.20 shall not be located in, under, or above cesspools, septic tanks, septic tank drainage
19.21 fields, seepage pits, soil treatment systems, contaminated soil, sewer manholes, catch
19.22 basins, storm water storage tanks, buried tanks containing chemicals or petroleum
19.23 products, or any other source of contamination that in the judgment of the administrative
19.24 authority might contaminate the potable water supply. A horizontal separation of ten
19.25 feet shall be maintained between the outer edge of the water supply pipe and the outer
19.26 edge of the contamination source.

20.1 Subp. 2. [Renumbered subp 4]

20.2 Subp. 3. **Section 609.10.** UPC section 609.10 is amended to read as follows:

20.3 **609.10 Water Hammer.** Building supply systems where water hammer occurs shall be
20.4 provided with water hammer arrestors to absorb the resulting high pressures. Water hammer
20.5 arrestors shall be approved mechanical devices that comply with ASSE 1010 or PDI-WH-201
20.6 and shall be installed as close as possible to quick-acting valves.

20.7 Subsection 609.10.1 Mechanical Devices is not amended.

20.8 Subp. 4. **Section 609.** UPC section 609 is amended by adding the following subsection:

20.9 **609.12 Water Meters.** Water meters shall be located in an approved location inside a
20.10 building as close as possible to the point of entrance of the potable water supply pipe,
20.11 installed at least 12 inches above the finished floor, and readily accessible. All water meter
20.12 installations shall be rigidly supported with a permanent support in order to prevent the
20.13 meter from vibrating when the water is passing through it.

20.14 **Exceptions:** Where installation inside a building is not possible, the water meter may
20.15 be installed in an enclosed structure not subject to flooding, high groundwater, or
20.16 surface drainage runoff, provided the meter is protected from freezing. Provisions shall
20.17 be made to install the meters above grade when possible. When installed below grade,
20.18 the top of the structure shall be located at least 12 inches above the finished grade, be
20.19 secured, and be accessible. This structure shall not be connected to any storm or sanitary
20.20 sewer system.

20.21 **4714.0611 WATER CONDITIONING EQUIPMENT.**

20.22 Subpart 1. **Section 611.** UPC sections 611.0 to 611.3 are amended to read as follows:

20.23 **611.0 Water Conditioning Equipment.**

21.1 **611.1 Application.** Water conditioning equipment shall comply with the requirements in
21.2 this section.

21.3 **611.1.1 Manufacture and Assembly.** Water conditioning equipment shall: (1) be
21.4 manufactured as a complete system; or (2) be assembled as a complete system by a
21.5 licensed plumbing contractor or licensed water conditioning contractor, using various
21.6 types of water conditioning equipment. Wetted surface materials used in water
21.7 conditioning equipment shall comply with ANSI/NSF 61 standards, or the equipment
21.8 shall comply with the applicable NSF standards as listed in Table 1701.1.

21.9 **Exception:** Water conditioning equipment that treats water for nonpotable uses
21.10 that are protected by an approved backflow device, assembly, or method as required
21.11 in Chapter 6, as amended.

21.12 **611.1.2 Labeling.** All conditioning equipment shall be labeled by:

21.13 (1) the manufacturer of equipment manufactured as a complete system; or

21.14 (2) the licensed plumbing contractor or licensed water conditioning contractor who assembled
21.15 the complete system

21.16 so as to clearly identify the type of equipment and the name and address of the manufacturer,
21.17 licensed plumbing contractor, or licensed water conditioning contractor.

21.18 **611.2 Airgap Discharge.** Any discharge from water conditioning equipment shall enter the
21.19 drainage system through an airgap in accordance with Table 603.3.1 or an airgap device in
21.20 accordance with Table 603.2, NSF 58, or IAPMO PS 65.

21.21 **611.3 Connection Tubing.** The tubing to and from water conditioning units shall be of a
21.22 size and material as recommended by the manufacturer. The tubing shall comply with the
21.23 requirements of NSF 14, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62, or the
21.24 appropriate material standards referenced in Table 1701.1.

22.1 Subp. 2. **Section 611.5.** Section 611.5 is added.

22.2 **611.5 Isolation and Bypass.** Every water conditioning installation shall include the
22.3 installation of isolation valves and a bypass valve which would allow the equipment to be
22.4 serviced or removed without the need for shutting off the water service completely.

22.5 **4714.0701 MATERIALS.**

22.6 UPC section 701.2 is amended to read as follows:

22.7 **701.2 Drainage Piping.** Materials for drainage piping shall be in accordance with one of
22.8 the referenced standards in Table 701.2 except that:

22.9 (1) Galvanized wrought-iron and galvanized steel pipe shall not be used underground and
22.10 shall be kept not less than 6 inches (152 mm) aboveground.

22.11 (2) ABS and PVC DWV piping installations shall be installed in accordance with applicable
22.12 standards referenced in Table 701.2.

22.13 (3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a
22.14 pump or ejector. They shall be kept not less than 12 inches (305 mm) belowground.

22.15 (4) Copper tube for drainage and pipe venting shall have a weight of not less than that of
22.16 copper drainage tube type DWV.

22.17 (5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept
22.18 not less than 6 inches (152 mm) aboveground.

22.19 (6) Cast-iron soil pipe and fittings shall be listed and tested in accordance with standards
22.20 referenced in Table 701.2. Such pipe and fittings shall be marked with country of origin
22.21 and identification of the original manufacturer in addition to markings required by referenced
22.22 standards.

22.23 UPC Table 701.2 is not amended.

23.1 **4714.0707 CLEANOUTS.**

23.2 UPC section 707.4 is amended to read as follows:

23.3 **707.4 Location.** Each horizontal drainage pipe shall be provided with a cleanout at its upper
23.4 terminal and each run of piping that is more than 100 feet (30,480 mm) in total developed
23.5 length shall be provided with a cleanout for each 100 feet (30,480 mm), or fraction thereof,
23.6 in length of such piping. An additional cleanout shall be provided in a drainage line for each
23.7 aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall
23.8 be installed above the fixture connection fitting, serving each urinal, regardless of the location
23.9 of the urinal in the building.

23.10 **Exceptions:**

23.11 (1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet
23.12 (1,524 mm) in length unless such line is serving sinks or urinals.

23.13 (2) Cleanouts shall be permitted to be omitted on a horizontal drainage pipe installed
23.14 on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth bend).

23.15 (3) Excepting the building drain, its horizontal branches, kitchen sinks, and urinals, a
23.16 cleanout shall not be required on a pipe or piping that is above the floor level of the
23.17 lowest floor of the building.

23.18 (4) An approved type of two-way cleanout fitting, installed inside the building wall
23.19 near the connection between the building drain and the building sewer or installed
23.20 outside of a building at the lower end of a building drain and extended to grade, shall
23.21 be permitted to be substituted for an upper terminal cleanout.

23.22 **4714.0710 DRAINAGE OF FIXTURES LOCATED BELOW THE NEXT**
23.23 **UPSTREAM MANHOLE OR BELOW THE MAIN SEWER LEVEL.**

23.24 Subpart 1. **Section 710.10.** UPC section 710.10 is amended to read as follows:

24.1 **710.10 Sump and Receiving Tank Covers and Vents.** Sumps and receiving tanks shall
24.2 be provided with substantial covers having a bolt-and-gasket-type manhole or equivalent
24.3 opening to permit access for inspection, repairs, and cleaning. The top shall be provided
24.4 with a vent pipe that shall extend separately through the roof or, where permitted, be
24.5 combined with other vent pipes. The vent pipe shall be large enough to maintain atmospheric
24.6 pressure within the sump under normal operating conditions and in no case shall be less in
24.7 size than that required by Table 703.2 for the number and type of fixtures discharging into
24.8 the sump, nor less than 1-1/2 inches (40 mm) in diameter. Where the preceding requirements
24.9 are met and the vent, after leaving the sump, is combined with vents from fixtures discharging
24.10 into the sump, the size of the combined vent need not exceed that required for the total
24.11 number of fixtures discharging into the sump. No vent from an air-operating sewage ejector
24.12 shall combine with other vents.

24.13 **Exception:** Vents serving sumps connected to elevator pit drains or swimming pool
24.14 deck drains need not extend through the roof and must not connect to any other vent
24.15 pipe.

24.16 Subpart 1. [Renumbered subp 2]

24.17 Subp. 2. **Section 710.12.** UPC section 710.12 is amended to read as follows:

24.18 **710.12 Grinder Pump Ejector.** Grinder pumps shall be permitted to be used. The sump
24.19 basin storage volume and the pump capacity shall be sized adequately to prevent overloading
24.20 and shall at a minimum accommodate water demand peak flow from all fixtures.

24.21 **710.12.1 Discharge Piping.** The discharge piping shall be sized in accordance with
24.22 the manufacturer's installation instructions and shall be not less than 1 1/4 inches (32
24.23 mm) in diameter. A check valve and fullway-type shutoff valve shall be located within
24.24 the discharge line.

24.25 Subp. 2. [Renumbered subp 3]

25.1 Subp. 3. **Section 710.13.** UPC section 710.13 is amended to read as follows:

25.2 **710.13 Macerating Toilet Systems.** Listed macerating toilet systems shall be permitted as
25.3 an alternate to a sewage pump system only in one- or two-family dwellings when gravity
25.4 flow is not possible. Not more than one bathroom group is permitted to discharge into a
25.5 macerating toilet system. One bathroom group consists of: a toilet; a lavatory; and a shower
25.6 or bathtub. Components of macerating toilet systems shall be accessible.

25.7 **710.13.1 Sumps.** The sump shall be watertight and gastight.

25.8 **710.13.2 Discharge Piping.** The discharge piping shall be sized in accordance with
25.9 the manufacturer's instructions and shall be not less than 3/4-inch (20 mm) in diameter.
25.10 The developed length of the discharge piping shall not exceed the manufacturer's
25.11 instructions. A check valve and fullway-type shutoff valve shall be located within the
25.12 discharge line or internally within the device.

25.13 **710.13.3 Venting.** The plumbing fixtures that discharge into the macerating device
25.14 shall be vented in accordance with this code. The sump shall be vented in accordance
25.15 with the manufacturer's instructions and the vent shall be permitted to connect to the
25.16 fixture venting.

25.17 **4714.0712 TESTING.**

25.18 *[For text of subpart 1, see Minnesota Rules]*

25.19 Subp. 2. **Section 712.** UPC section 712 is amended by adding subsections to read as
25.20 follows:

25.21 **712.4 Negative Test.** Concrete manholes and sewer lines shall be tested by negative pressure
25.22 in accordance with ASTM Standards C1214-19 and C1244-17 or the Hydrostatic Test
25.23 Method in section 1107.2.3(B).

26.1 **712.5 Finished Plumbing.** After the plumbing fixtures have been set and their traps filled
 26.2 with water, their connections shall be tested and proven gastight and watertight by plugging
 26.3 the stack openings on the roof and the building drain where it leaves the building, and air
 26.4 introduced into the system equal to the pressure of a 1-inch water column. Such pressure
 26.5 shall remain constant for 15 minutes or the duration of the inspection without the introduction
 26.6 of additional air.

26.7 **712.6 Test Plugs or Caps.** Test plugs or caps for roof terminals shall extend above or
 26.8 outside the end of the vent pipe to provide a visible indication for removal after the test has
 26.9 been completed.

26.10 **4714.0717 SIZE OF BUILDING SEWERS.**

26.11 UPC section 717, Table 717.1, is amended to read as follows:

26.12 **TABLE 717.1**

26.13 **Maximum/Minimum Fixture Unit Loading on Building Sewer Piping**

26.14 **SLOPE (inches per foot)**

26.15	Size of Pipe (inches)	1/16	1/8	1/4
26.16	6 and smaller	(As specified in Table 703.2/No minimum loading)		
26.17	8*	1950/1500	2800/625	3900/275
26.18	10*	3400/1600	4900/675	6800/300
26.19	12*	5600/1700	8000/725	11 200/325

26.20 *Loadings less than the listed minimums must be approved by the Authority Having
 26.21 Jurisdiction.

26.22 For SI units: 1 inch = 25 mm, 1 inch per foot = 83.3 mm/m

26.23 **4714.0719 CLEANOUTS.**

26.24 UPC section 719.6 is amended to read as follows:

27.1 **719.6 Manholes.** Approved manholes shall be permitted to be installed in lieu of cleanouts,
27.2 where first approved by the Authority Having Jurisdiction. The maximum distance between
27.3 manholes shall not exceed 300 feet (91,400 mm). Connections to manhole and similar
27.4 structures must be provided as follows:

27.5 1. The inlet and outlet connections shall be made by the use of a flexible compression joint
27.6 not less than 12 inches (305 mm) and not exceeding 3 feet (914 mm) from the manhole. No
27.7 flexible compression joints shall be embedded in the manhole base.

27.8 2. Approved resilient rubber joints must be used to make watertight connections to manholes,
27.9 catch basins, and other structures.

27.10 **4714.0724 RECREATIONAL VEHICLE.**

27.11 UPC chapter 7 is amended by adding the following sections:

27.12 **724.0 Recreational Vehicle Sanitary Disposal Station.**

27.13 **724.1 Construction.** Each recreational vehicle sanitary disposal (dump) station shall have
27.14 a concrete slab with the drainage system located as to be on the road (left) side of the
27.15 recreational vehicle. The slab shall be not less than 3 feet by 3 feet (914 mm by 914 mm),
27.16 not less than 3-1/2 inches (89 mm) thick, and properly reinforced. The slab surface shall be
27.17 troweled to a smooth finish and sloped from each side inward to a drainage system inlet.

27.18 The drainage system inlet shall consist of a 4-inch (102 mm), self-closing, foot-operated
27.19 hatch of materials meeting these rules with the cover milled to fit tight. The hatch body
27.20 shall be set in the concrete of the slab with the lip of the opening flush with its surface to
27.21 facilitate the cleansing of the slab with water. The hatch shall be properly connected to a
27.22 drainage system inlet, which shall discharge to a public or private sewer meeting the same
27.23 requirements as provided in this code for building sewers.

27.24 **724.2 Flushing Device.** The recreational vehicle sanitary disposal station flushing device
27.25 shall consist of a supported riser terminating not less than 2 feet (610 mm) above the ground

28.1 surface, with a 3/4-inch (20 mm) valved outlet adaptable for a flexible hose. The flexible
 28.2 hose shall be designed such that it cannot lie on the ground. The water supply to the flushing
 28.3 device shall be protected from backflow by means of a listed vacuum breaker or backflow
 28.4 prevention device located downstream from the last shutoff valve. A pressure-type vacuum
 28.5 breaker backflow device must be provided if a shut-off valve is installed downstream of
 28.6 the backflow device. Direct connections between:

28.7 (1) the water piping and sewer-connected waste piping; and

28.8 (2) the water piping and the recreational vehicle holding tank;

28.9 are not allowed to exist under any condition with or without backflow protection.

28.10 Adjacent to the recreational vehicle sanitary disposal station shall be posted a sign of
 28.11 durable material not less than 2 feet by 2 feet (610 mm by 610 mm) in size. Inscribed on
 28.12 the sign in clearly legible letters shall be the following:

28.13 "DANGER - NOT TO BE USED FOR DRINKING OR DOMESTIC PURPOSES."

28.14 **724.3 Drainage Pipe Sizes.** The minimum pipe diameters of drainage pipes serving
 28.15 recreational vehicle sites shall be in accordance with Table 724.3.

28.16 **TABLE 724.3**

28.17 **DRAINAGE PIPE SIZES**

28.18	28.19	28.20	28.21
	Maximum Number of Recreational		Minimum Pipe Sizes (Inches)
	Vehicles Served		
28.20	36		4
28.21	71		5
28.22	120		6
28.23	440		8

28.24 **4714.0801 INDIRECT WASTES.**

28.25 Subpart 1. **Section 801.3.2.** UPC section 801.3.2 is amended to read as follows:

29.1 **801.3.2 Walk-In Coolers.** Floor drains shall not be located inside walk-in coolers
29.2 unless they are specifically required by the licensing authority. Where required, floor
29.3 drains shall be connected to a separate drainage line discharging into an outside receptor.
29.4 The flood-level rim of the receptor shall not be less than 6 inches (152 mm) lower than
29.5 the lowest floor drain. The floor drains shall be trapped and individually vented.
29.6 Cleanouts shall be provided at 90 degree (1.57 rad) turns and shall be accessibly located.
29.7 The waste shall discharge through an air gap or air break into a trapped and vented
29.8 receptor, except that a full-size air gap is required where the indirect waste pipe is under
29.9 vacuum.

29.10 Subp. 2. **Section 801.3.3.** UPC section 801.3.3 is amended to read as follows:

29.11 **801.3.3 Food-Handling Fixtures.** Cooking ranges, steam kettles, potato peelers, ice
29.12 cream dipper wells, and similar equipment shall be indirectly connected to the drainage
29.13 system by means of an air gap. Bins, cooling counters, compartments, and other
29.14 equipment having drainage connections and used for the storage of unpackaged ice
29.15 used for human ingestion, or used in direct contact with ready-to-eat food, shall be
29.16 indirectly connected to the drainage system by means of an air gap. Each indirect waste
29.17 pipe from food-handling fixtures, storage or holding compartments, or equipment shall
29.18 be separately trapped and piped to the indirect waste receptor and shall not combine
29.19 with other indirect waste pipes. The piping from the equipment to the receptor shall be
29.20 not less than the drain on the unit, and in no case less than 3/4 inch (20 mm).

29.21 Subp. 3. **Section 801.4.** UPC section 801.4 is deleted in its entirety.

29.22 **4714.0807 APPLIANCES.**

29.23 UPC section 807.3 is amended to read as follows:

29.24 **807.3 Domestic Dishwashing Machine.** No domestic dishwashing machine shall be directly
29.25 connected to a drainage system or food waste disposer without the use of an approved

30.1 dishwasher air gap fitting on the discharge side of the dishwashing machine or run the
30.2 discharge line as high as possible under the countertop, securely fastened. Listed air gaps
30.3 shall be installed with the flood level (FL) marking at or above the flood level of the sink
30.4 or drainboard, whichever is higher.

30.5 **4714.0810 STEAM AND HOT WATER DRAINAGE CONDENSERS AND SUMPS.**

30.6 UPC section 810 is amended to read as follows:

30.7 **810.0 Steam and Hot Water Drainage Condensers and Sumps.**

30.8 **810.1 High-Temperature Discharge.** No steam pipe shall be directly connected to a
30.9 plumbing or drainage system, nor shall water having a temperature above 140°F (60°C) be
30.10 discharged under pressure directly into a drainage system.

30.11 **4714.0811 PLASTIC WASTE AND VENT PIPES.**

30.12 UPC section 811 is amended to add subsection 811.9 as follows:

30.13 **811.9 Waste and Vent.** Thermal expansion and contraction compensation shall be provided
30.14 for every 30 feet of developed horizontal or vertical length of run for thermoplastic piping
30.15 as shown in Table 313.3.1.

30.16 **4714.0813 SWIMMING POOLS.**

30.17 UPC section 813.1 is amended to read as follows:

30.18 **813.1 General.** Pipes carrying wastewater from swimming or wading pools, including pool
30.19 drainage and backwash from filters, water from scum gutter drains and pool deck drains,
30.20 shall be installed as an indirect waste. Pool deck drains need not be trapped and vented per
30.21 section 803.1. Pool deck drain piping must be pitched at a minimum of 1/8-inch per foot
30.22 for pipe sizes 3 inches and larger. Where a pump is used to discharge waste pool water to
30.23 the drainage system, the pump discharge shall be installed as an indirect waste.

31.1 **4714.0814 CONDENSATE WASTES AND CONTROL.**

31.2 Subpart 1. **Section 814.1.** UPC section 814.1 is amended to read as follows:

31.3 **814.1 Condensate Disposal.** Where discharged into the drainage system, equipment shall
31.4 drain by means of an indirect waste pipe.

31.5 Subp. 2. **Table 814.3.** UPC Table 814.3 is deleted.

31.6 Subp. 3. **Section 814.3.** UPC section 814.3 is deleted in its entirety.

31.7 Subp. 4. **Section 814.5.** UPC section 814.5 is amended to read as follows:

31.8 **814.5 Point of Discharge.** Air-conditioning condensate waste pipes shall connect indirectly
31.9 to the interior drainage system through an air gap or air break to: (1) properly trapped and
31.10 vented receptors; (2) the tailpiece of an approved plumbing fixture; or (3) an exterior place
31.11 of disposal approved by the Minnesota Pollution Control Agency.

31.12 Condensate waste shall not drain over a public way or in areas causing a nuisance.

31.13 **4714.0903 MATERIALS.**

31.14 UPC section 903.1 is amended to read as follows:

31.15 **903.1 Applicable Standards.** Vent pipes and fittings shall comply with the applicable
31.16 standards referenced in Table 701.2, except that:

31.17 (1) Galvanized steel or 304 stainless steel pipe shall not be installed underground and shall
31.18 be not less than 6 inches (152 mm) aboveground.

31.19 (2) ABS and PVC DWV piping installations shall be in accordance with the applicable
31.20 standards referenced in Table 1701.1.

31.21 **4714.1001 TRAPS REQUIRED.**

31.22 UPC section 1001.2 is amended to read as follows:

32.1 **1001.2 Where Required.** Each plumbing fixture shall be separately trapped by an approved
 32.2 type of liquid seal trap. This section shall not apply to fixtures with integral traps. Not more
 32.3 than one trap shall be permitted on a trap arm. Food waste disposal units installed with a
 32.4 set of restaurant, commercial, or industrial sinks shall be connected to a separate trap. Each
 32.5 domestic clothes washer and each laundry tub shall be connected to a separate and
 32.6 independent trap, except that a laundry tub shall be permitted to also receive the waste from
 32.7 a clothes washer set adjacent thereto. The vertical distance between a fixture outlet and the
 32.8 trap weir shall be as short as practicable, but in no case shall the tailpiece from a fixture
 32.9 exceed 24 inches (610 mm) in length. One trap shall be permitted to serve a set of not more
 32.10 than three single compartment sinks or laundry tubs of the same depth or three lavatories
 32.11 immediately adjacent to each other and in the same room where the waste outlets are not
 32.12 more than 30 inches (762 mm) apart and the trap is centrally located where the three
 32.13 compartments are installed.

32.14 **4714.1002 TRAPS PROTECTED BY VENT PIPES.**

32.15 UPC section 1002.2 is amended to read as follows:

32.16 **1002.2 Fixture Traps.** Each fixture trap shall have a protecting vent located so that the
 32.17 developed length of the trap arm from the trap weir to the inner edge of the vent shall be
 32.18 within the distance given in Table 1002.2 but in no case less than two times the diameter
 32.19 of the trap arm.

32.20 **Exception:** Emergency floor drains, tell tale floor drains, and floor drains not used as
 32.21 waste receptors installed within 25 feet of a vented branch or main.

32.22 **4714.1006 FLOOR DRAIN TRAPS.**

32.23 UPC section 1006.1 is amended to read as follows:

32.24 **1006.1 General.** Floor drains shall connect into a trap constructed so that the trap can be
 32.25 readily cleaned and be of a size to efficiently serve the purpose for which the trap is intended.

33.1 The drain inlet shall be located so that it is in full view. Where subject to the reverse flow
33.2 of sewage or liquid waste, such drains shall be equipped with an approved backwater valve.

33.3 **Exception:** Floor drains or trench drains that connect to sand interceptors or oil and
33.4 flammable liquid interceptors do not need to be trapped.

33.5 **4714.1009 INTERCEPTORS (CLARIFIERS) AND SEPARATORS.**

33.6 Subpart 1. UPC section 1009.2 is amended to read as follows:

33.7 **1009.2 Approval.** The size, type, and location of each interceptor (clarifier) or separator
33.8 shall meet the requirements of this chapter.

33.9 **Exception:** Interceptors or separators that are engineered and manufactured and are
33.10 documented by the manufacturer and the project registered professional engineer to be
33.11 properly designed and sized for the specific project, and are approved by the Authority
33.12 Having Jurisdiction.

33.13 No wastes other than those requiring treatment or separation shall be discharged into an
33.14 interceptor (clarifier) or separator unless specifically permitted elsewhere in this code.

33.15 Subp. 2. Section 1009.4 is amended to read as follows:

33.16 **1009.4 Relief Vent.** Interceptors (clarifiers) shall be so designed that they will not become
33.17 air-bound where closed covers are used. Each interceptor (clarifier) shall be properly vented.
33.18 Interceptor (clarifier) and neutralization tank vent ports shall be located above the highest
33.19 liquid flow level.

33.20 **4714.1016 SAND INTERCEPTORS.**

33.21 UPC section 1016.4 is amended to read as follows:

33.22 **1016.4 Separate Use.** Sand and similar interceptors shall be so designed and located as to
33.23 be readily accessible for cleaning, have a water seal of not less than 6 inches (152 mm), and
33.24 be vented.

34.1 **Exception:** Sand interceptors connecting to oil and flammable liquid interceptors
34.2 meeting the requirements of section 1017 do not require a water seal or vent.

34.3 **4714.1017 OIL AND FLAMMABLE LIQUID INTERCEPTORS.**

34.4 Subpart 1. **Section 1017.1.** UPC section 1017.1 is amended to read as follows:

34.5 **1017.1 Interceptors Required.** Repair garages and gasoline stations with grease racks or
34.6 grease pits, parking garages over 1,000 square feet, vehicle wash facilities, and factories
34.7 that have oily waste, flammable waste, or both as a result of manufacturing, storage,
34.8 maintenance, repair, or testing processes, shall be provided with an oil or flammable liquid
34.9 interceptor that shall be connected to necessary floor drains. The separation or vapor
34.10 compartment shall be independently vented to the outer air. Where two or more separation
34.11 or vapor compartments are used, each shall be vented to the outer air or shall be permitted
34.12 to connect to a header that is installed at a minimum of 6 inches (152 mm) above the spill
34.13 line of the lowest floor drain and vented independently to the outer air. The minimum size
34.14 of a flammable vapor vent shall be not less than 2 inches (51 mm) and, where vented through
34.15 a sidewall, the vent shall be not less than 10 feet (3,048 mm) above the adjacent level at an
34.16 approved location. The interceptor shall be vented on the sewer side and shall not connect
34.17 to a flammable vapor vent. Oil and flammable interceptors shall be provided with gastight
34.18 cleanout covers that shall be readily accessible. Drains discharging into interceptors must
34.19 not be designed to retain liquid waste. The waste line shall be not less than 3 inches (80
34.20 mm) in diameter with a full-size cleanout to grade. Where an interceptor is provided with
34.21 an overflow, it shall be provided with an overflow line, not less than 2 inches (50 mm) in
34.22 diameter, to an approved waste oil tank having a minimum capacity of 550 gallons (2,082
34.23 L) and meeting the requirements of the Authority Having Jurisdiction. The waste oil from
34.24 the separator shall flow by gravity or shall be pumped to a higher elevation by an automatic
34.25 pump. Pumps shall be adequately sized and accessible. Waste oil tanks shall have a 2 inch

35.1 (50 mm) minimum pumpout connection at grade and a 1-1/2 inch (38 mm) minimum vent
35.2 to atmosphere at an approved location not less than 10 feet (3,048 mm) above grade.

35.3 Subp. 2. **Section 1017.2.** UPC section 1017.2 is amended to read as follows:

35.4 **1017.2 Design of Interceptors.** Each manufactured interceptor that is rated shall be stamped
35.5 or labeled by the manufacturer with an indication of its full discharge rate in gpm (L/s). The
35.6 full discharge rate of such an interceptor shall be determined at full flow. Each interceptor
35.7 shall be rated equal to or greater than the incoming flow and shall be provided with an
35.8 overflow line to an underground tank.

35.9 Interceptors not rated by the manufacturer shall have a depth of not less than 2 feet
35.10 (610 mm) below the invert of the discharge drain. The outlet opening shall have not less
35.11 than an 18 inch (457 mm) water seal and shall have a minimum capacity as follows: Where
35.12 not more than three motor vehicles are serviced, stored, or both, interceptors shall have a
35.13 minimum capacity of 6 cubic feet and 1 cubic foot of capacity shall be added for each vehicle
35.14 up to 10 vehicles. Above 10 vehicles, each interceptor shall have a holding capacity of not
35.15 less than 35 cubic feet. Where vehicles are serviced and not stored, interceptor capacity
35.16 shall be based on a net capacity of 1 cubic foot (0.03 m³) for each 100 square feet (9.29 m²)
35.17 of the surface to be drained into the interceptor, with a minimum of 6 cubic feet (0.2 m³).

35.18 **1017.2.1 Maintenance.** Service and maintenance records shall be kept by the owner
35.19 and available for viewing by the Authority Having Jurisdiction upon request. The
35.20 service and maintenance records shall demonstrate periodic removal of accumulated
35.21 substances in the oil and flammable liquid interceptor based on the interceptor's capacity
35.22 as required by the manufacturer's recommended maintenance instructions. Where the
35.23 Authority Having Jurisdiction determines that an interceptor is not being properly
35.24 cleaned or maintained, the Authority Having Jurisdiction shall have the authority to
35.25 mandate a maintenance program.

36.1 **4714.1101 GENERAL.**

36.2 Subpart 1. **Section 1101.2.** UPC section 1101.2 is amended to read as follows:

36.3 **1101.2 Where Required.** Roofs, paved areas, yards, courts, courtyards, vent shafts, light
36.4 wells, or similar areas having rainwater, shall be drained into a separate storm sewer system
36.5 or into a combined sewer system where a separate storm sewer system is not available, or
36.6 to some other place of disposal satisfactory to the Authority Having Jurisdiction. In no case
36.7 shall water from roofs or any building roof drainage flow onto the public sidewalk. In the
36.8 case of one- and two-family dwellings, storm water shall be permitted to be discharged on
36.9 flat areas, such as lawns, so long as the storm water shall flow away from the building and
36.10 away from adjoining property and shall not create a nuisance.

36.11 Subp. 2. **Section 1101.3.** UPC section 1101.3 is amended to read as follows:

36.12 **1101.3 Storm Water Drainage to Sanitary Sewer Prohibited.** Storm water shall not be
36.13 drained into sewers intended for sanitary drainage unless approved by the municipal sewer
36.14 authority or stated elsewhere in this code.

36.15 Subp. 3. **Section 1101.4.** UPC section 1101.4 is amended to read as follows:

36.16 **1101.4 Material Uses.** Rainwater piping placed within the interior of a building or run
36.17 within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, brass, copper,
36.18 lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, stainless steel 304 or 316L [stainless
36.19 steel 304 pipe and fittings shall not be installed underground and shall be kept not less than
36.20 6 inches (152 mm) aboveground], or other approved materials. Changes in direction shall
36.21 be in accordance with Section 706.0. ABS and PVC DWV piping installations shall be
36.22 installed in accordance with applicable standards referenced in Table 1701.1.

36.23 UPC subsections 1101.4.1 through 1101.4.6 are maintained without amendment.

36.24 Subp. 4. **Section 1101.12.** UPC section 1101.12 is amended to read as follows:

36.25 **1101.12 Roof Drainage.**

37.1 **1101.12.1 Primary Roof Drainage.** When roof areas of a building are drained by roof
37.2 drains, the location and sizing of the drains shall be coordinated with the structural
37.3 design and pitch of the roof in accordance with section 1106 or as permitted elsewhere
37.4 in this code. The roof drainage system shall be sized on a basis of a rate of rainfall of
37.5 at minimum 4 inches per hour.

37.6 **1101.12.2 Secondary Drainage.** Secondary (emergency) roof drainage shall be provided
37.7 in accordance with Minnesota Rules, chapter 1305.

37.8 **1101.12.2.1 Location.** Unless roof design is certified by a Registered Design
37.9 Professional specializing in Structural Engineering for the maximum possible
37.10 depth of water that will pond in accordance with Minnesota Rules, chapter 1305,
37.11 secondary roof drainage shall be located 2 inches above the lowest point of the
37.12 roof surface.

37.13 **1101.12.2.2 Engineered System.** Engineered siphonic roof drainage systems must
37.14 not be utilized in the design of a secondary roof drainage system.

37.15 UPC Table 1103.1 is not amended.

37.16 Subp. 5. ~~Sections Subsections 1101.12.2.1, 1101.12.2.2, 1101.12.2.2.1, and~~
37.17 **1101.12.2.2.2.** ~~UPC subsections 1101.12.2.1, 1101.12.2.2, 1101.12.2.2.1, and 1101.12.2.2.2~~
37.18 are deleted in their entirety.

37.19 **4714.1106 [Renumbered 4714.1103]**

37.20 **4714.1103 SIZE OF LEADERS, CONDUCTORS, AND STORM DRAINS.**

37.21 UPC sections 1103.1, 1103.2, and 1103.3 are amended to read as follows:

37.22 **1103.1 Vertical Conductors and Leaders.** Vertical conductors and leaders shall be sized
37.23 by the maximum projected roof area and Table 1103.1. For sizes not listed under Table
37.24 1103.1, a minimum rainfall rate of 4 inches per hour must be used to size the rainwater
37.25 piping.

38.1 **1103.2 Size of Horizontal Storm Drains and Sewers.** The size of building storm drains,
 38.2 or building storm sewers or their horizontal branches shall be based on the maximum
 38.3 projected roof or paved area to be handled and Table 1103.2. For sizes not listed under
 38.4 Table 1103.2, a minimum rainfall rate of 4 inches per hour must be used to size the rainwater
 38.5 piping.

38.6 **1103.3 Reduction in Size Prohibited.** Except for siphonic roof drainage systems, storm
 38.7 drain piping shall not reduce in size in the direction of flow, including changes in direction
 38.8 from horizontal to vertical.

38.9 **4714.1108 [Renumbered 4714.1105]**

38.10 **4714.1105 CONTROLLED-FLOW ROOF DRAINAGE.**

38.11 UPC section 1105.1 is amended to read as follows:

38.12 **1105.1 Application.** The controlled-flow roof drainage system shall be sized on the basis
 38.13 of controlled flow and storage of the storm water on the roof, provided the design is based
 38.14 on a minimum of 4 inches per hour and the following conditions are met:

38.15 (1) The water from a 25-year-frequency storm shall not be stored on the roof for more than
 38.16 24 hours.

38.17 (2) During the storm, the water depth on the roof shall not exceed the depths specified in
 38.18 Table 1105.1(1).

38.19 (3) Not less than two drains shall be installed in roof areas of 10,000 square feet (929 m²)
 38.20 or less, and not less than one additional drain shall be installed for each additional 10,000
 38.21 square feet (929 m²) or less of roof area.

38.22 (4) Each roof drain shall have a precalibrated, fixed (nonadjustable), and proportional weir
 38.23 (notched) in a standing water collar inside the strainer. No mechanical devices or valves
 38.24 shall be allowed.

39.1 (5) Pipe sizing shall be based on the precalibrated rate of flow (gpm) (L/s) of the precalibrated
39.2 weir for the maximum allowable water depth, and Tables 1103.1 and 1103.2.

39.3 (6) The height of stones or other granular material above the waterproofed surface shall not
39.4 be considered in water depth measurement, and the roof surface in the vicinity of the drain
39.5 shall not be recessed to create a reservoir.

39.6 (7) Roof design, where controlled-flow roof drainage is used, shall be such that the design
39.7 roof live load is not less than 40 lb/ft².

39.8 (8) Scuppers shall be provided in parapet walls. The distance of scupper bottoms above the
39.9 roof level at the drains shall not exceed the maximum distances specified in Table 1105.1(2).

39.10 (9) Scupper openings shall be not less than 4 inches (102 mm) high and have a width equal
39.11 to the circumference of the roof drain required for the area served, sized in accordance with
39.12 Table 1103.1.

39.13 (10) Flashings shall extend above the top of the scuppers.

39.14 (11) At a wall or parapet, 45-degree (0.79 rad) cants shall be installed.

39.15 (12) Separate storm and sanitary drainage systems shall be provided within the building.

39.16 (13) Calculations for the roof drainage system shall be submitted, along with the plans, to
39.17 the Authority Having Jurisdiction for approval.

39.18 UPC Table 1105.1(1) and Table 1105.1(2) are not amended.

39.19 **4714.1109 [Renumbered 4714.1107]**

39.20 **4714.1107 TESTING.**

39.21 Subpart 1. **Section 1107.1.** UPC section 1107.1 is amended to read as follows:

39.22 **1107.1 Testing Required.** Building storm drainage systems that are new and parts of existing
39.23 systems that have been altered, extended, or repaired shall be tested in accordance with

40.1 section 712 to disclose leaks and defects, except as provided in section 1107.2.3. Any section
40.2 of the building storm sewer that passes through contaminated soils or contaminated water
40.3 must be air tested in accordance with section 712.3.

40.4 Subp. 2. **Section 1107.2.3.** UPC subsection 1107.2.3 is amended to read as follows:

40.5 **1107.2.3 Exceptions.**

40.6 (A) Testing is not required for:

40.7 (1) outside leaders;

40.8 (2) perforated or open drain tile; or

40.9 (3) portions of storm drainage system and sewers that are located more than ten feet
40.10 from buildings, more than ten feet from buried water lines, and more than 50 feet from
40.11 water wells, and that do not pass through soil or water identified as being contaminated.

40.12 (B) Building storm sewers shall be tested in accordance with section 712 or the
40.13 Hydrostatic Test Method from the City Engineers Association of Minnesota. The
40.14 Hydrostatic Test Method, provisions E2 and E3, as specified in Standard Utilities
40.15 Specifications for Watermain and Service Line Installation and Sanitary Sewer and
40.16 Storm Sewer Installation, written and published by the City Engineers Association of
40.17 Minnesota, 2018 edition, is incorporated by reference, is not subject to frequent change,
40.18 and is available in the office of the commissioner of labor and industry.

40.19 **4714.1110 [Renumbered 4714.1106]**

40.20 **4714.1106 SIPHONIC ROOF DRAINAGE SYSTEM.**

40.21 UPC chapter 11 is amended by adding a new section and subsections as follows:

40.22 **1106.0 Siphonic Roof Drainage System.**

40.23 **1106.1 General Requirements.** Siphonic roof drainage systems shall be designed as an
40.24 engineered siphonic roof drainage system when allowed by the administrative authority.

41.1 The engineered siphonic roof drainage system shall meet the requirements of sections 1106.2
41.2 and 1106.3.

41.3 **1106.2 Design Criteria.** The siphonic roof drainage system shall be designed and certified
41.4 by a registered professional engineer.

41.5 **1106.2.1 Sizing.** The system shall be sized on the basis of a minimum rate of rainfall
41.6 of 4 inches per hour.

41.7 **1106.2.2 Design.** The drainage system shall be designed according to ASPE Standard
41.8 45, Siphonic Roof Drainage, and according to the manufacturer's recommendations
41.9 and requirements. Manufacturer design software shall be in accordance with ASPE
41.10 Standard 45.

41.11 **1106.2.3 Roof Drain Bodies.** Roof drains shall meet ASME A112.6.9, Siphonic Roof
41.12 Drains.

41.13 **1106.2.4 Water Accumulation.** When designed for water accumulation, the roof shall
41.14 be designed for the maximum possible water accumulation according to section 1105.1
41.15 (7), as amended in this code, and Minnesota Rules, chapter 1305.

41.16 **1106.2.5 Pipe Size and Cleanouts.** Minimum pipe size shall be 1-1/2 inches. All pipe
41.17 sizes and cleanouts in the drainage system shall be designed and installed according to
41.18 ASPE Standard 45.

41.19 **1106.2.6 Horizontal Pipes.** Horizontal pipe size shall not reduce in the direction of
41.20 flow.

41.21 **1106.2.7 Plans and Specifications.** The plans and specifications for the drainage system
41.22 shall indicate the siphonic roof drainage system as an engineered method used for the
41.23 design.

42.1 **1106.2.8 Markings.** The installed drainage system shall be permanently and
 42.2 continuously marked as a siphonic roof drainage system at approved intervals and
 42.3 clearly at points where piping passes through walls and floors. Roof drains shall be
 42.4 marked in accordance with ASME A112.6.9.

42.5 **1106.2.9 Transition Locations.** The transition locations from the siphonic roof drainage
 42.6 system to a gravity system shall be determined by the registered professional engineer
 42.7 at a location approved by the administrative authority. The design, sizing, and venting
 42.8 of the transition location shall be in accordance with ASPE Standard 45. The gravity
 42.9 portion of the building storm sewer system receiving the siphonic roof drainage system
 42.10 shall be sized for the design rate but not less than a rainfall rate of 4 inches per hour
 42.11 and in accordance with section 1103.0.

42.12 **1106.2.10 Required Submissions.** All plans, specifications, and calculations shall be
 42.13 signed and sealed by the registered professional engineer and submitted to the
 42.14 administrative authority. The submitted calculations shall include performance data
 42.15 for the drainage system for the required rainfall rate, including the minimum and
 42.16 maximum calculated operating pressures and velocities verifying that the design solution
 42.17 is within the operating parameters required by the design standard. All performance
 42.18 data shall be reported as the extreme maximum and minimum calculations and shall
 42.19 not be presented as averaged data.

42.20 **1106.3 Proof of Suitability.** Upon completion of the project: proper tests, inspections, and
 42.21 certification of the siphonic roof drainage system shall be performed according to items
 42.22 1106.3.1 and 1106.3.2:

42.23 **1106.3.1 Testing.** Testing shall be performed according to ASPE Standard 45.

42.24 **1106.3.2 Written Certification.** Prior to the final plumbing inspection, the registered
 42.25 professional engineer shall provide written certification to the administrative authority
 42.26 that the system has been visually inspected by the registered professional engineer or

43.1 the registered professional engineer's designee and the installation has been properly
43.2 implemented according to the certified design, plans, calculations, and specifications.
43.3 The submitted written certification shall include any field modification from the initial
43.4 design involving dimensions, location, or routing of the siphonic roof drainage system
43.5 that shall be reapproved and recertified by the registered professional engineer and be
43.6 accompanied by a final as-built design of the altered system and supported by calculated
43.7 data to show that the overall system remains in accordance with ASPE Standard 45.

43.8 **4714.1401 [Renumbered 4714.1701]**

43.9 **4714.1605 INSPECTION AND TESTING.**

43.10 UPC section 1605.3 is amended to read as follows:

43.11 **1605.3 Cross-Connection Inspection and Testing.** The potable and rainwater catchment
43.12 water systems shall be isolated from each other and independently inspected and tested to
43.13 ensure there is no cross-connection in accordance with sections 1605.3.1 through 1605.3.4.

43.14 **1605.3.1 Visual System Inspection.** Prior to commencing the cross-connection testing
43.15 and annually thereafter, a dual system inspection shall be conducted as follows:

43.16 Pumps, equipment, equipment room signs, and exposed piping in an equipment room
43.17 shall be inspected for visible cross-connections, proper operation, and damage.

43.18 **1605.3.2 Cross-Connection Test.** The following procedure shall be followed by the
43.19 plumbing contractor in the presence of the Authority Having Jurisdiction to determine
43.20 whether a cross-connection has occurred:

43.21 (1) The potable water system shall be activated and pressurized. The rainwater
43.22 catchment water system shall be shut down and completely drained.

43.23 (2) The potable water system shall remain pressurized while the rainwater catchment
43.24 water system is completely drained. The minimum period the rainwater catchment
43.25 water system is to remain completely drained shall be determined based on the

44.1 size and complexity of the potable water system and rainwater catchment water
44.2 distribution system, but in no case shall that period be less than one hour.

44.3 (3) Fixtures, potable water, and rainwater, shall be tested and inspected for flow.
44.4 Flow from a rainwater catchment water system outlet indicates a cross-connection.
44.5 No flow from a potable water outlet indicates that it is connected to the rainwater
44.6 catchment water system.

44.7 (4) The drain on the rainwater catchment water system shall be checked for flow
44.8 during the test and at the end of the testing period.

44.9 (5) The potable water system shall then be completely drained.

44.10 (6) The rainwater catchment water system shall then be activated and pressurized.

44.11 (7) The rainwater catchment water system shall remain pressurized for a minimum
44.12 time specified by the Authority Having Jurisdiction while the potable water system
44.13 is completely drained. The minimum period the potable water system is to remain
44.14 completely drained shall be based on the size and complexity of the potable water
44.15 system and rainwater catchment water distribution system but in no case shall that
44.16 period be less than one hour.

44.17 (8) Fixtures, potable and rainwater catchment, shall be tested and inspected for
44.18 flow. Flow from a potable water system outlet indicates a cross-connection. No
44.19 flow from a rainwater catchment water outlet indicates that it is connected to the
44.20 potable water system.

44.21 (9) The drain on the potable water system shall be checked for flow during the test
44.22 and at the end of the testing period.

44.23 (10) Where there is no flow detected in the fixtures that would indicate a
44.24 cross-connection, the potable water system shall be repressurized.

45.1 **1605.3.3 Discovery of Cross-Connection.** In the event that a cross-connection is
45.2 discovered, the following procedure, in the presence of the Authority Having
45.3 Jurisdiction, shall be activated immediately:

45.4 (1) Rainwater catchment water piping to the building shall be shut down at the
45.5 meter and the rainwater water riser shall be drained.

45.6 (2) Potable water piping to the building shall be shut down at the meter.

45.7 (3) The cross-connection shall be uncovered and disconnected.

45.8 (4) The building shall be retested following procedures listed in sections 1605.3.1
45.9 and 1605.3.2.

45.10 (5) The potable water system shall be chlorinated with 50 ppm chlorine for 24
45.11 hours.

45.12 (6) The potable water system shall be flushed after 24 hours, and a standard
45.13 bacteriological test shall be performed. Where test results are acceptable, the
45.14 potable water system shall be permitted to be recharged.

45.15 **1605.3.4 Inspection.** An annual inspection of the rainwater catchment water system,
45.16 following the procedures in Section 1605.3.1, shall be required. Cross-connection
45.17 testing, following the procedures listed in section 1605.3.2, shall be required every five
45.18 years.

45.19 Alternate testing requirements shall be permitted by the Authority Having
45.20 Jurisdiction.

45.21 **4714.1701 REFERENCED STANDARDS.**

45.22 Subpart 1. UPC Table 1701.1 is modified to add the following:

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
46.1 46.2			
46.3 46.4 46.5	ASSE 1084-2018 Water Heaters with Temperature Limiting Capacity	Appliances	407.3, 409.4, 410.3
46.6 46.7 46.8	ASSE 1085-2018 Water Heaters for Emergency Equipment	Appliances	416.2
46.9 46.10 46.11 46.12 46.13	ASTM Standards C1214-19 Concrete Pipe Sewerlines by Negative Air Pressure (Vacuum) Test Method		712.4
46.14 46.15 46.16 46.17 46.18	ASTM Standards C1244-17 Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill		712.4
46.19	CSA B125.3-2018 Plumbing Fittings	Fittings	409.4, 410.3
46.20 46.21 46.22 46.23 46.24 46.25 46.26 46.27	Hydrostatic Test Method (City Engineers Association of Minnesota) - 2018 Standard Utilities Specifications for Watermain and Service Line Installation and Sanitary Sewer and Storm Sewer Installation	Storm Drainage	1107.2.3(B)

46.28 Subp. 2. UPC Table 1701.1 is modified by amending the following:

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
46.29 46.30			
46.31 46.32	ASME A112.6.9-2005 Siphonic Roof Drains	DWV Components	1106.2.3, 1106.2.8
46.33 46.34 46.35	ASME A112.18.1 - 2018 / CSA B125.1 - 2018 Plumbing Supply Fittings	Fittings	408.3, 417.1, 417.2, 417.3, 417.4, 417.6, 603.5.19

47.1 47.2 47.3	ASPE Standard 45	Siphonic Roof Drainage	Roof Drainage	1106.2.2 1106.2.5, 1106.2.9, 1106.3.1, 1106.3.2
47.4 47.5	ASSE 1023-2019	Electrically Heated or Cooled Water Dispensers	Appliances	417.6

47.6 Unless amended above, all other entries in UPC Table 1701.1 are not amended.

47.7 Subp. 3. UPC Table 1701.2 is modified to delete the following:

47.8 47.9	STANDARD NUMBER	STANDARD TITLE	APPLICATION
47.10 47.11	ASSE 1023-1979	Hot Water Dispensers Household Storage Type - Electrical	Appliances

47.12 Subp. 4. UPC Table 1701.2 is modified by adding the following:

47.13 47.14	STANDARD NUMBER	STANDARD TITLE	APPLICATION
47.15 47.16 47.17	ASSE 1082-2018	Water Heaters with Integral Temperature Control Devices for Hot Water Distribution Systems	Appliances

47.18 **4714.1701 [Renumbered 4714.1601]**

47.19 **4714.1601 GENERAL.**

47.20 Subpart 1. **Section 1601.1.** UPC section 1601.1 is amended to read as follows:

47.21 **1601.1 Applicability.** The provisions of this chapter shall apply to the installation,
47.22 construction, alteration, and repair of rainwater catchment systems for nonpotable applications
47.23 listed in section 1602.1.

47.24 **1601.1.1 Irrigation.** Rainwater catchment systems used for lawn irrigation are not
47.25 covered under this chapter.

47.26 **1601.1.2 Combination Systems.** Rainwater catchment systems used for lawn irrigation
47.27 in combination with any uses listed in section 1602.1 shall meet the requirements of

48.1 this chapter. The irrigation system shall be separated by an air gap or proper backflow
48.2 protection as required for potable water.

48.3 Subp. 2. **Section 1601.11.** UPC section 1601.11 is amended to read as follows:

48.4 **1601.11 Abandonment.** All rainwater catchment systems that are no longer in use and fail
48.5 to be maintained in accordance with section 1601.5 shall be considered abandoned.

48.6 Abandoned rainwater catchment systems are subject to sections 1601.11.1 and 1601.11.2.

48.7 **1601.11.1 General.** Every abandoned rainwater catchment system or part thereof
48.8 covered under the scope of this chapter, as amended in this code, shall be disconnected
48.9 from any remaining systems, drained, plugged, and capped per the requirements of this
48.10 code. Storm drainage systems of abandoned rainwater catchment systems must comply
48.11 with chapter 11, Storm Drainage, as amended.

48.12 **1601.11.2 Underground Tank.** Every underground water storage tank that has been
48.13 abandoned or otherwise discontinued from use in a rainwater catchment system covered
48.14 under the scope of this chapter, as amended in this code, shall be completely drained
48.15 and filled with earth, sand, gravel, or concrete or removed in a manner approved by
48.16 the administrative authority.

48.17 **4714.1702 NONPOTABLE RAINWATER CATCHMENT SYSTEMS.**

48.18 Subpart 1. [Renumbered 4714.1602 subpart 1]

48.19 Subp. 2. [Renumbered 4714.1602 subp 2]

48.20 Subp. 3. [Renumbered 4714.1602 subp 3]

48.21 Subp. 4. [Renumbered 4714.1602 subp 4]

48.22 Subp. 5. [Renumbered 4714.1602 subp 5]

48.23 Subp.6. [Renumbered 4714.1602 subp 6]

- 49.1 Subp.7. [Renumbered 4714.1602 subp 7]
- 49.2 Subp.8. [Renumbered 4714.1602 subp 8]
- 49.3 Subp. 9. [Renumbered 4714.1603 subpart 1]
- 49.4 Subp. 10. [Renumbered 4714.1603 subp 2]
- 49.5 Subp. 11. [Renumbered 4714.1603 subp 3]
- 49.6 Subp. 12. [Renumbered 4714.1603 subp 4]
- 49.7 Subp. 13. [Renumbered 4714.1603 subp 5]
- 49.8 Subp. 14. [Renumbered 4714.1603 subp 6]
- 49.9 Subp. 15. [Renumbered 4714.1603 subp 7]
- 49.10 Subp. 16. [Renumbered 4714.1604]
- 49.11 Subp. 17. [Renumbered 4714.1605]
- 49.12 Subp. 18. [See repealer.]
- 49.13 Subp. 19. [See repealer.]
- 49.14 Subp. 20. [See repealer.]
- 49.15 Subp. 21. [See repealer.]
- 49.16 Subp. 22. [Renumbered 4714.1601 subp 2]

49.17 **4714.1602 NONPOTABLE RAINWATER CATCHMENT SYSTEMS.**

49.18 Subpart 1. **Section 1602.1.** UPC section 1602.1 is amended to read as follows:

49.19 **1602.1 General.** The installation, construction, alteration, and repair of rainwater catchment
49.20 systems intended to supply uses such as water closets, urinals, trap primers for floor drains

50.1 and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower
50.2 makeup, and similar uses shall be approved by the commissioner.

50.3 Subp. 2. **Section 1602.2.** UPC section 1602.2 is amended to read as follows:

50.4 **1602.2 Plumbing Plan Submission.** No permit for a rainwater catchment system shall be
50.5 issued until complete plumbing plans have been submitted and approved by the commissioner
50.6 in accordance with Minnesota Rules, part 1300.0215, subpart 6.

50.7 Subp. 3. **Section 1602.4.** UPC section 1602.4 is amended to read as follows:

50.8 **1602.4 Connections to Potable or Reclaimed (Recycled) Water Systems.** Rainwater
50.9 catchment systems shall have no direct connection to a potable water supply or alternate
50.10 water source system. Potable or reclaimed (recycled) water is permitted to be used as makeup
50.11 water for a rainwater catchment system provided the potable or reclaimed (recycled) water
50.12 supply connection is protected by an air gap or reduced-pressure principle backflow preventer
50.13 in accordance with this code. An automatic means to supply the rainwater catchment system
50.14 with makeup water shall be installed when there is insufficient rainwater to meet the required
50.15 demand or due to system failure.

50.16 Subp. 4. **Section 1602.5.** UPC section 1602.5 is amended to read as follows:

50.17 **1602.5 Initial Cross-Connection Test.** Where a portion of a rainwater catchment system
50.18 is installed within a building, a cross-connection test is required in accordance with section
50.19 1605.3, as amended. Before the building is occupied or the system is activated, the plumbing
50.20 contractor shall perform the initial cross-connection test in the presence of the Authority
50.21 Having Jurisdiction. The test shall be ruled successful before final approval is granted.

50.22 Subp. 5. **Section 1602.7.** UPC section 1602.7 is amended to read as follows:

50.23 **1602.7 Rainwater Catchment System Materials.** Rainwater catchment system materials
50.24 shall comply with sections 1602.7.1 through 1602.7.4.

51.1 **1602.7.1 Water Supply and Distribution Materials.** Rainwater catchment water
51.2 supply and distribution materials shall comply with Chapter 6, as amended in this code,
51.3 and the requirements of this code for potable water supply and distribution systems,
51.4 unless otherwise provided for in this section.

51.5 **1602.7.2 Rainwater Catchment System Drainage Materials.** Materials used in
51.6 rainwater catchment drainage systems, including gutters, downspouts, conductors, and
51.7 leaders shall be in accordance with Chapter 11, as amended in this code, and the
51.8 requirements of this code for storm drainage.

51.9 **1602.7.3 Storage Tanks.** Rainwater storage tanks shall comply with section 1603.1,
51.10 as amended in this code.

51.11 **1602.7.4 Collection Surfaces.** The collection surface shall be constructed of a hard,
51.12 impervious material.

51.13 Subp. 6. **Section 1602.9.** UPC sections 1602.9.3 and 1602.9.5 are amended to read
51.14 as follows:

51.15 **1602.9.3 Collection Surfaces.** Rainwater catchment systems shall collect rainwater
51.16 only from roof surfaces. Rainwater catchment systems shall not collect rainwater from:

51.17 (1) vehicular parking surfaces;

51.18 (2) surface water runoff;

51.19 (3) bodies of standing water; or

51.20 (4) similar nonroof surfaces.

51.21 **1602.9.5 Prohibited Discharges.** Overflows and bleed-off pipes from roof-mounted
51.22 equipment and appliances, condensate, and other waste disposal shall not discharge
51.23 onto roof surfaces that collect rainwater for rainwater catchment systems.

51.24 Subp. 7. **Section 1602.9.** UPC section 1602.9.6 is amended to read as follows:

52.1 **1602.9.6 Minimum Water Quality.** The minimum water quality for rainwater
 52.2 catchment systems shall meet the applicable water quality recommendations in Table
 52.3 1602.9.6.

52.4 Subp. 8. **Table 1602.9.6.** UPC Table 1602.9.6 is amended to read as follows:

52.5 **TABLE 1602.9.6**

52.6	Measure	Limit
52.7	E. coli (MPN/100 mL)	2.2
52.8	Odor	Non-offensive
52.9	Temperature (degrees Celsius)	MR
52.10	Color	MR
52.11	pH	MR

52.12 MR = measured and recorded only

52.13 Treatment:

52.14 100-micron or smaller filter

52.15 Minimum 3.5-log reduction of bacteria

52.16 Subp. 17. [Renumbered 4714.1605]

52.17 Subp. 18. [See repealer.]

52.18 Subp. 19. [See repealer.]

52.19 Subp. 20. [See repealer.]

52.20 Subp. 21. [See repealer.]

52.21 Subp. 22. [Renumbered 4714.1601 subp 2]

52.22 **4714.1603 RAINWATER STORAGE TANKS.**

52.23 Subpart 1. **Section 1603.2.** UPC section 1603.2 is amended to read as follows:

53.1 **1603.2 Construction.** Rainwater storage shall be constructed of solid, durable materials
53.2 not subject to excessive corrosion or decay, watertight, and suitable for rainwater storage.

53.3 Subp. 2. **Section 1603.7.** UPC section 1603.7 is amended to add the following:

53.4 **1603.7 Animals and Insects.** Rainwater tank openings shall be protected to prevent
53.5 the entrance of insects, birds, or rodents into the tank and piping system. Screen
53.6 installed on vent pipes, inlets, and overflow pipes shall be corrosion-resistant and
53.7 have an aperture of not greater than 1/16 inch (1.6 mm) and shall be close-fitting.

53.8 Subp. 3. **Section 1603.9.** UPC section 1603.9 is amended to read as follows:

53.9 **1603.9 Storage Tank Venting.** A vent shall be installed on each tank. The vent
53.10 shall extend from the top of the tank and terminate a minimum of 12 inches above
53.11 grade, shall be a minimum of 1-1/2 inches in diameter, and shall be turned
53.12 downward.

53.13 Subp. 4. **Section 1603.10.** UPC section 1603.10 is amended to read as follows:

53.14 **1603.10 Pumps.** Pumps serving rainwater catchment systems shall be listed. Pumps
53.15 supplying water to water closets, urinals, and trap primers shall be capable of delivering
53.16 not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest
53.17 and most remote outlet served. Where the water pressure in the rainwater supply system
53.18 within the building exceeds 80 psi (552 kPa), a listed pressure-reducing valve reducing the
53.19 pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed in
53.20 accordance with this code.

53.21 Subp. 5. **Section 1603.11.** UPC section 1603.11 is amended to read as follows:

53.22 **1603.11 Roof Drains.** Primary and secondary roof drain systems shall be designed and
53.23 installed in accordance with Chapter 11, as amended in this code. Secondary roof drains
53.24 shall be equipped with a working alarm.

54.1 Subp. 6. **Section 1603.12.** UPC section 1603.12 is amended to read as follows:

54.2 **1603.12 Water Quality Devices and Equipment.** The rainwater catchment system shall
54.3 include filtration and disinfection to maintain the minimum water quality requirements in
54.4 Table 1602.9.6. At a minimum, a 100-micron absolute filter shall be provided along with
54.5 disinfection to provide a 3.5-log reduction of bacteria. Devices and equipment used to treat
54.6 rainwater shall be suitable for rainwater catchment system applications, properly designed,
54.7 sized, and documented for the specific project by a Minnesota registered professional
54.8 engineer.

54.9 Subp. 7. **Sections 1603.15 and 1603.16.** UPC sections 1603.15 and 1603.16 are
54.10 deleted in their entirety.

54.11 **4714.1604 SIGNS.**

54.12 UPC section 1604.2 is amended to read as follows:

54.13 **1604.2 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be
54.14 installed in restrooms in commercial, industrial, and institutional occupancies using
54.15 nonpotable rainwater for water closets, urinals, or both. Each sign shall contain 1/2-inch
54.16 (12.7 mm) letters of a highly visible color on a contrasting background. The location of the
54.17 sign(s) shall be such that the sign(s) shall be visible to users. Each sign shall contain one of
54.18 the following texts as determined by the application:

54.19 **1604.2 (A) TO CONSERVE WATER, THIS BUILDING USES RAINWATER**
54.20 **TO FLUSH TOILETS AND URINALS.**

54.21 **1604.2 (B) TO CONSERVE WATER, THIS BUILDING USES RAINWATER**
54.22 **TO FLUSH TOILETS.**

54.23 **1604.2 (C) TO CONSERVE WATER, THIS BUILDING USES RAINWATER**
54.24 **TO FLUSH URINALS.**

55.1 **1604.2 (D) TO CONSERVE WATER, THIS BUILDING USES RAINWATER**

55.2 **TO * _____ ***

55.3 *** _____ * shall indicate the rainwater usage.**

55.4 **REPEALER.** Minnesota Rules, parts 4714.0314; 4714.0507, subpart 2; 4714.0511;

55.5 4714.0604; 4714.0705; and 4714.1702, subparts 18, 19, 20, and 21, are repealed.